UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,417	09/22/2003	Robert J. Small	60937-0215-US	6517

9629 7590 06/30/2005

MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER	
MARCHESCHI, MICHAEL A	

ART UNIT	PAPER NUMBER
1755	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/665,417	SMALL ET AL.	
	Examiner	Art Unit	
	Michael A. Marcheschi	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 December 2004* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *37,42-60,64 and 68-75* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *37,42-59 and 74* is/are allowed.

6)☒ Claim(s) *60,64,68-73 and 75* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 68-73 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 68 is considered new matter in view of the composition defined in part b) of the claim. The claims defines a composition "consisting essentially of a ammonium nitrate, at least one abrasive, **at least one second oxidizer different from the first, optionally a corrosion inhibitor** and water", however this composition has never been literally define in the specification. Applicants point to Table E_x for defining support, however the composition in this table contains ammonium nitrate, **benzotriazole**, **DI** water and a **hydrazine solution**. Clearly the table requires specific components to be present but the new claim requires "**at least one second oxidizer different from the first, optionally a corrosion inhibitor and water.** According to the table a **hydrazine solution** must be used (second oxidizer), **benzotriazole** must be used (corrosion inhibitor) and **DI** water must be used. The claim defines a (1) generic second oxidizer and not the specific one that is used in the table, (2) an optional corrosion inhibitor but the table definitely requires a specific corrosion inhibitor (benzotriazole) and (3) water but the table requires the water to be **DI** water. How can a specific disclosure provide support for the

newly broad composition used? In addition, the specification only provides support for benzotrioazole and not a broad class of corrosion inhibitors.

Claim 70 is new matter because the claimed pH is not defined for a two oxidizer slurry that contains ammonium hydroxide. The above table (E_x) defines a different pH for the composition, thus how is the claimed pH supported?

Claim 73 is new matter because Table E_x, which applicant state provide support for this, defines a hydrazine **solution** and not hydrazine alone.

Claims 60, 64 and 75 are rejected under 35 U.S.C. 103(a) as obvious over either (1) Imai et al., (2) Mandigo et al. (436) or (3) Easter **all** in view of Uchikura et al.

The teachings according to the reference are defined in the previous office action which are incorporated herein by reference.

Imai teach that, in an alternative to ammonium nitrate, the composition can contain **other** oxidizers. Mandigo et al. uses the phrase "such as" to define the oxidizers. Easter states that the any known oxidizer can be used. In view of the above, it is the examiners position that the teachings of the references are **not** limited to the specific oxidizers set forth and that others can be used. In view of this, it is the examiners position that any conventional oxidizer would have been obvious (the references imply that any conventional oxidizer can be used) and since an aluminum salt (i.e. nitrate) is a conventional polishing oxidizer, as shown by the secondary reference, one skilled in the art would have found it obvious to use aluminum nitrate as the oxidizer in the compositions according to these references. In addition, the substitution of one

oxidizer for another that is used for the same purpose (polishing) is well within the level of ordinary skill in the art. Although the secondary reference does not literally defined aluminum nitrate, it defines that aluminum salt can be used and aluminum nitrate is an aluminum salt, thus it is within the scope of the oxidizers defined by the secondary reference. This reference also states that the oxidizer is "**aluminum** salts... or other cationic salts of...**nitrates**". It is the examiners position that this would suggests that the aluminum salt can be a nitrate contrary to any evidence showing otherwise.

With respect to the process, the primary references teach that these compositions can be used to polishing the claimed materials.

Assuming arguendo about the new matter rejection above, the following would also apply.

Claims 68-72 are rejected under 35 U.S.C. 103(a) as obvious over either (1) Imai et al. or (2) Easter **both** in view of Uchikura et al.

The teachings according to the reference are defined in the previous office action which are incorporated herein by reference.

Although the primary references do not disclose a combination of oxidizers, this would have been obvious because it is prima facie obvious to combine two or more materials disclosed by the prior art to form a third material (combination of oxidizers) that is to be used for the same purpose. In re Kerkhoven 205 USPQ 1069. With respect to the colloidal silica limitation, the references teach compositions comprising silica and although these references do not teach the

use of colloidal silica, it is the examiners position that any conventional silica polishing abrasive would have been obvious (the references imply that any conventional abrasive can be used) and since colloidal silica is a conventional polishing abrasive, one skilled in the art would have found it obvious to use colloidal silica as the abrasive in the compositions according to these references. In addition, the substitution of one abrasive for another that is used for the same purpose (polishing) is well within the level of ordinary skill in the art. In addition, the references teach silica, in general, and this encompasses colloidal silica because **"A generic disclosure renders a claimed species prima facie obvious.** ***Ex parte George*** **21 USPQ 2d 1057, 1060 (BPAI 1991);** ***In re Woodruff*** **16 USPQ 2d 1934;** ***Merk & Co. v. Biocraft Lab. Inc.*** **10 USPQ 2d 1843 (Fed. Cir. 1983);** ***In re Susi*** **169 USPQ 423 (CCPA 1971)".** With respect to the size of colloidal silica (being obvious), colloidal silica generally has a size within the claimed range and therefore this limitation is obvious. With respect to the consisting essentially limitation, although Imai et al. uses an organic acid this is still within the scope of "consisting essentially of" because it is the examiners position that this component will not materially effect the basic and novel properties of the composition absent evidence to the contrary.

With respect to the process, the primary references teach that these compositions can be used to polishing the claimed materials.

Claims 68-72 are rejected under 35 U.S.C. 103(a) as obvious over Mandigo et al.

The teachings according to the reference is defined in the previous office action which are incorporated herein by reference.

The reference teaches a composition that comprises ammonium nitrate and another nitrate, benzotriazole and water. Although the reference uses another components (polyacrylic acid) this is still within the scope of "consisting essentially of" because it is the examiners position that this component will not materially effect the basic and novel properties of the composition absent evidence to the contrary. With respect to the colloidal silica limitation, the reference teaches a compositions comprising silica and although the reference does not teach the use of colloidal silica, it is the examiners position that any conventional silica polishing abrasive would have been obvious (the reference implies that any conventional abrasive can be used) and since colloidal silica is a conventional polishing abrasive, one skilled in the art would have found it obvious to use colloidal silica as the abrasive in the compositions according to this reference. In addition, the substitution of one abrasive for another that is used for the same purpose (polishing) is well within the level of ordinary skill in the art. In addition, the reference teaches silica, in general, and this encompasses colloidal silica because **"A generic disclosure renders a claimed species prima facie obvious. *Ex parte George* 21 USPQ 2d 1057, 1060 (BPAI 1991); *In re Woodruff* 16 USPQ 2d 1934; *Merk & Co. v. Biocraft Lab. Inc.* 10 USPQ 2d 1843 (Fed. Cir. 1983); *In re Susi* 169 USPQ 423 (CCPA 1971)".** With respect to the size of colloidal silica (being obvious), colloidal silica generally has a size within the claimed range and therefore this limitation is obvious.

With respect to the process, the primary reference teaches that this composition can be used to polishing the claimed materials.

In all of the above rejections, although the references might not add the materials as aqueous solutions, no distinction is seen to exist because it is the examiners position that when the composition of the materials is combined with water, the claimed aqueous solution of said materials will be apparent.

Applicant's arguments filed 12/24/04 have been fully considered but they are not persuasive.

Applicants argue that Imai et al., Mandigo et al. and Easter fails to teach or suggest the aluminum nitrate oxidizer and that the references disclose or suggest only metal free oxidizers. With respect to applicants arguments based on the references only disclosing or suggesting metal free oxidizers, the references do **not** literally state that only metal free oxidizers can be used. To the contrary, Imai et al. states that **other oxidizers** can be used and this does not limit the oxidizers to only metal free oxidizers. Mandigo et al. uses the phrase "such as" to define the oxidizers and "such as" is not an implication of only the oxidizers disclosed in the reference. Easter et al. states that any suitable oxidizing agent known in the art can be used" and this statement is not an implication of only the oxidizers disclosed in the reference. In view of the above, how art the references limited to only metal free oxidizers as argued? If the references intended the oxidizers to include only the ones specified and or only metal free oxidizers, the references would have defined this (metal free) and/or would not have used the limitations "other oxidizers", "such as" and "any suitable oxidizer" Applicants also argue that the reference disclose preferred oxidizer but as is well known, **"A reference can be used for all it realistically teaches and is not limited to the disclosure in its preferred embodiments" See**

***In re Van Marter*, 144 USPQ 421.** With respect to aluminum nitrate oxidizer, (1) Imai teach that, in an alternative to ammonium nitrate, the composition can contain **other** oxidizers, (2) Mandigo et al. uses the phrase "such as" to define the oxidizers and (3) Easter et al. states that any suitable oxidizer known in the art can be used. Uchikura et al. (secondary reference) discloses that aluminum salts are known oxidizers, thus the use of aluminum salts as the oxidizers according to the Imai et al., Mandigo et al. and Easter et al. would have been obvious because the substitution on one known oxidizer for another that is used for the same purpose (polishing) is clearly within the scope pf the skilled artisan. Although the secondary reference does not literally define aluminum nitrate, it defines that aluminum salt is a known oxidizer and aluminum nitrate is an aluminum salt, thus it is within the scope of the oxidizers defined by the secondary reference. This is also apparent because the limitations "other", "such as" and "any" to define the oxidizers in the primary references do **not** limited to the specific oxidizers set forth and that others can be used. In view of this, it is the examiners position that any conventional oxidizer would have been obvious (the references imply that any conventional oxidizer can be used) and since aluminum salt (nitrate) is a conventional polishing oxidizer, one skilled in the art would have found it obvious to use aluminum nitrate as the oxidizer in the compositions according to these references. With respect to the Uchikura et al. reference, applicants argue that this reference is directed to iron based nitrates and not aluminum salts, such as nitrate. The examiner fails to understand this argument because the reference clearly teach aluminum salts as oxidizers and although not literally defined, aluminum nitrate is an aluminum salt thus it is within the scoop of the reference. Applicants have not provide any evidence supporting the above arguments and a mere statement without any evidence to support it does not establish a

persuasive argument. This reference also states that "**aluminum** salts... or other cationic salts of...**nitrates**" are known oxidizers and applicants argument is that no **literal** disclosure of aluminum nitrate is defined. The examiner acknowledges that no literal disclosure is defined but the reference clearly states "aluminum salts or other cationic salts of **nitrates**" and this would suggests that the aluminum salt can be a nitrate and applicants have not shown any evidence rebutting this. Applicants also argue that to pick aluminum nitrate is improper hindsight. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Finally, applicants argue that it would not have been obvious to pick, chose and use aluminum nitrate from the oxidizers disclosed by Uchikura et al. Applicants have not clearly defined any convincing reasons to support this, especially in view of the fact that this reference discloses that aluminum salts (i.e. aluminum nitrate is an aluminum salt) are oxidizers. No criticality is provided forth use of aluminum nitrate over any other oxidizer.

Applicants also appear to be arguing that no motivation to combine the references is apparent. To the contrary, the motivation to combine the reference is that all of the primary references suggest that other known oxidizers can be use (i.e. they clearly disclose, by way of the limitations "other", "such as" and "any") and therefore they are not limited to the specific ones defined therein. In addition, the motivation is that the substitution of one known oxidizer for

another that is to be used for the same purpose is clearly within the scope of the skilled artisan. Applicants have not shown any evidence to rebut this statement previously made in the last office action. Applicants again argue the preferred oxidizers of the references and state that this teaches away from the use of other oxidizers (i.e. aluminum nitrate). Again **"a reference can be used for all it realistically teaches and is not limited to the disclosure in its preferred embodiments" See *In re Van Marter*, 144 USPQ 421.** In view of this, how can a preferred embodiment teach away from another species when the references are not limited to said embodiments?

With respect to the colloidal silica limitation, applicants argue that none of the primary references disclose this and states that the examiners asserts that the disclosure of **conventional** silica renders this obvious. They further go on to state that there is difference between colloidal silica and conventional silica. The examiner is well aware of the difference between the two silica's but has merely stated that any conventional silica polishing abrasive would have been obvious (the references imply that any conventional abrasive can be used) and since colloidal silica is a conventional polishing abrasive, one skilled in the art would have found it obvious to use colloidal silica as the abrasive in the compositions according to these references. Applicants have not clearly shown any evidence as to why the use of colloidal silica is not obvious. In addition, the substitution of one abrasive for another that is used for the same purpose (polishing) is well within the level of ordinary skill in the art. In addition, the references teach silica, in general, and this encompasses colloidal silica because **"A generic disclosure renders a claimed species prima facie obvious. *Ex parte George* 21 USPQ 2d 1057, 1060 (BPAI 1991); *In re Woodruff* 16 USPQ 2d 1934; *Merk & Co. v. Biocraft Lab. Inc.* 10 USPQ 2d 1843 (Fed. Cir.**

1983); *In re Susi* 169 USPQ 423 (CCPA 1971)". Finally, if a generic disclosure renders a species obvious, as defined by the above case law, why doesn't the teaching of silica, in general, make a silica species (colloidal silica) obvious? Applicants state that web page has been enclosed with the response but no such document has been received.

Applicants also argue that Mandigo et al. is not directed to polishing a conducing layer., a dielectric layer and a barrier layer. This is not persuasive because the reference clearly teaches that the above structure is polished (see column 2, lines 56-60).

Applicants also appear to be arguing a combination rejection based on Mandigo et al. and Imai et al. (see paragraph bridging pages 13 and 14) but no such combination is made.

With respect to the arguments based on new claim 68, this claim is new matter for the above reads, however, assuming arguendo, the examiner will respond to any arguments. Applicants argue that Imai et al. and Easter only use one oxidizer. Although this might be true, the combination is obvious in view of In re Kerkhoven 205 USPQ 1069, defined above. Applicants also argue that Imai et al. uses an organic acid and Mandigo et al. uses polyacrylic acid. Although this is true, it is the examiners position that the use of these components is still within the scope of "consisting essentially of" because it is the examiners position that these components will not materially effect the basic and novel properties of the composition absent evidence to the contrary.

In view of the teachings as set forth above, it is the examiners position that the references reasonably teach or suggest the limitations of the rejected claims.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Claims 37, 42-59 and 74 are allowable over the prior art of record because said art fails to teach or suggest a method of polishing the claimed materials using a phase one slurry followed by polishing with the specific slurry defined in the claims. **Specifically, the limitations "wherein the substrate has been polished with a phase one slurry to planarize copper" in combination with the planarizing composition used in the planarizing steps defined in parts (b) and (c) of the independent claims are <u>not</u> taught or suggested.**

A reference is good not only for what it teaches but also for what one of ordinary skill might reasonably infer from the teachings. *In re Opprecht* 12 USPQ 2d 1235, 1236 (CAFC 1989); *In re Bode* USPQ 12; *In re Lamberti* 192 USPQ 278; *In re Bozek* 163 USPQ

545, 549 (CCPA 1969); *In re Van Mater* 144 USPQ 421; *In re Jacoby* 135 USPQ 317; *In re LeGrice* 133 USPQ 365; *In re Preda* 159 USPQ 342 (CCPA 1968). In addition, "A reference can be used for all it realistically teaches and is not limited to the disclosure in its preferred embodiments" See *In re Van Marter*, 144 USPQ 421.

Evidence of unexpected results must be clear and convincing. *In re Lohr* 137 USPQ 548. Evidence of unexpected results must be commensurate in scope with the subject matter claimed. *In re Linder* 173 USPQ 356.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Marcheschi whose telephone number is (571) 272-1374. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael A Marcheschi
Primary Examiner
Art Unit 1755

MM
6/24/05